

Fig. 17—White oil sump

most certainly been frowned upon a few years ago.

Overlapping cycles of the six-cylinder engine, mentioned before in connection with exhaust discharges, occurs equally in the intake. Due to the greater average load factor of the truck engine, the robbing effect of one cylinder on another is all the more marked. The truck is an article of relatively high initial cost, and low maintenance cost is very important. For this reason the use of duplex carburetors on six-cylinder truck engines is warranted.

Force feed lubrication to the piston pin has been mentioned. The timing gear train, and the bearings of the idler gear, accessory driveshaft, and rocker arms and shaft in valve-in-head engines have individual positive feeds. The loads imposed on the timing gear train by valve operation, oil and water pumps and fan drive, the generator and occasionally an air compressor are considerably higher than is generally appreciated. Bus practice of driving air compressors directly from the crankshaft is worth copying.

Oil distribution from the pump by means of drilled passageways in the crankcase, cast-in pipes, tubing manifolds, and a combination of these, is found in about equal numbers. The oil sump is usually in the rear half portion of the crankcase lower half, the front half being made as shallow as possible to provide ample axle clearance. One of the simplest and most effective

means of removing foreign matter and heavy constituents from the oil is by means of deposition at low velocity. The construction shown in Fig. 17 has a settling chamber with a large screened area and consequently low velocity. As the oil flows upward toward the screen, any solid particles in it separate out and those reaching the screen are mostly shaken off by vibration.

Crankcase dilution is not so important an item in truck service; still, crankcase ventilation is desirable and is being used. If effected by connection to the carburetor air intake, intake valve stem lubrication is secured and the building up of crankcase pressure and the crankcase breathing action are greatly reduced. Crankcase over-pressure often has been the cause of unruly oil leaks, and these are entirely eliminated by ventilation. The auxiliary oiling system, consisting in feeding fresh, uncontaminated oil to the cylinder walls, has not made the progress that might have been expected in view of the merits of the scheme, probably because of the extra initial cost.

Detachable bell housings, which simplify the crankcase casting considerably, are increasing in number. These are secured by studs or cap screws. Figs. 2 and 18 show the use of two through bolts at each side. The timing inspection opening formerly usually located at the top of the bell housing, is being placed on the forward side where it is accessible without removing the floor board. This opening can be seen in the transverse sectional view Fig. 11.

The preferable ignition system for trucks is still a debatable question and probably will continue to be until the Diesel engine some day settles the argument. Battery ignition is making inroads on the small and medium sized engines, while the magneto is holding its own in the heavy class. The adoption of pneumatic tires is favoring the battery system as their superior cushioning effect constitutes a better safeguard for the battery than the former resilient battery cradles on solid-tired trucks.

The arduous duty of the spark plug calls primarily for ample cooling of the metal into which it is screwed. With large electrodes, substantial plug construction, and a well-cooled plug boss, the heat flow from the electrode tips will be sufficiently rapid to keep the plug temperature within bounds.

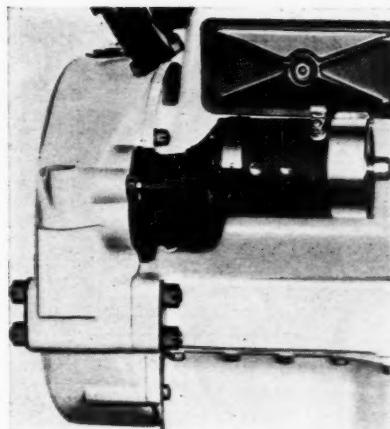


Fig. 18—Waukesha detachable bell housing with through bolts on both sides

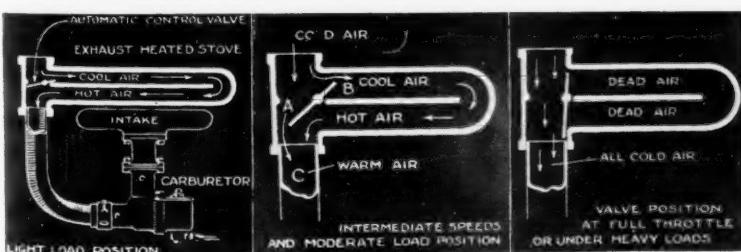
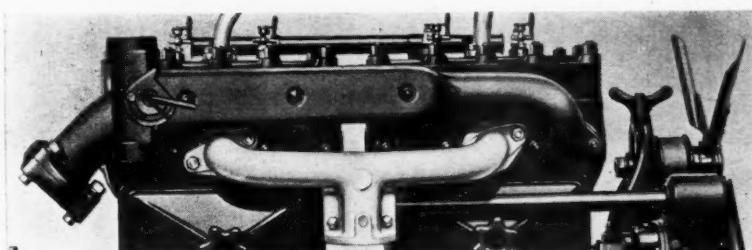


Fig. 16—Waukesha dynamic thermostat with diagrams showing its operation

Many Specially Designed *in Automotive*

*Few standard test devices
of work, particularly*

By A. F.

DURING the past year or more, in descriptions of new cars and announcements of car changes, attention has been called frequently to the important factor which the laboratory has come to play in development work. While each laboratory development, when taken alone, may appear to be of minor importance, in the aggregate this work has been responsible to a large extent for the strides recently made in improving performance, comfort and dependability.

In working out such developments, research laboratories and proving grounds have been faced with the problem of adequate instrumentation. While there are many highly developed commercial laboratory instruments of a general nature, developed by makers of test equipment, and their importance is great, it is practically impossible for these manufacturers to anticipate demands for special equipment of every conceivable type. Each laboratory has its own problems to face, which are duplicated only occasionally in other laboratories. As a result, laboratory engineers have been placed largely on their own initiative as regards the development of test methods and instruments.

It was originally intended to make a complete survey of all automotive laboratories to determine what general lines are being followed in the development of labora-

tory instrumentation. However, calls at only a few institutions, including the Studebaker Corp., General Motors Research Corp. and Proving Ground, Dodge Brothers, Inc., Hupp Motor Co. and the White Motor Co., indicated that few general deductions could be made regarding procedure and methods of instrumentation. It can be said that research work breaks down into the following classifications:

1. Strictly research work, including chemical and physical studies.
2. Developmental work consisting in comparative studies of existing types and of the best methods of improvement. Proving ground tests of various kinds

Fig. 1—Right: This interesting decelerometer developed by Studebaker consists of mercury filled tubes with platinum contacts connected to timed counters. The tubes can be set and calibrated to read for any desired rate of deceleration

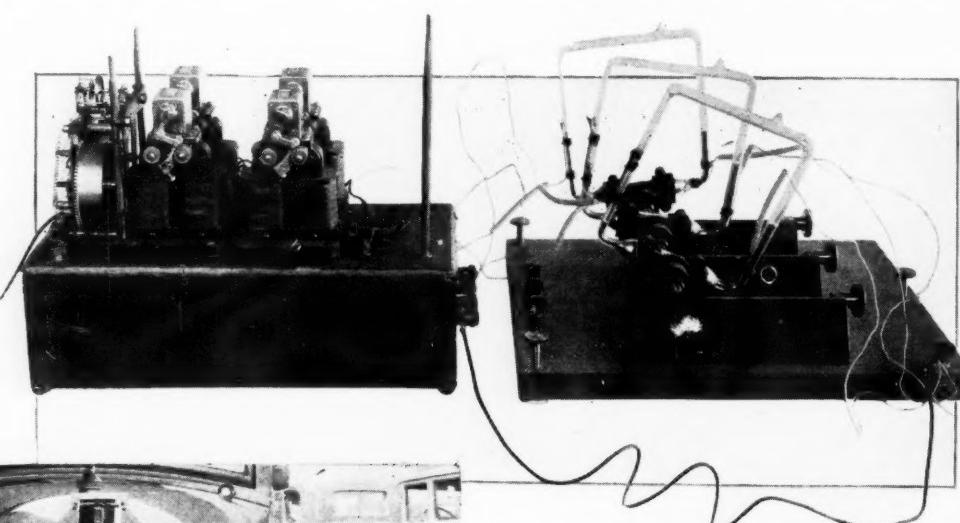
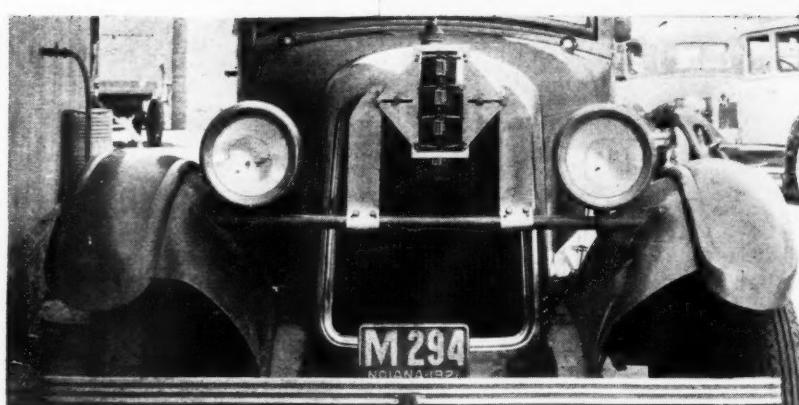


Fig. 2—Left: For studying fender wobble, the Studebaker Corp. uses this simple device with three counters set to register at different amplitudes



also come under this classification.

3. Life tests of various parts. This work is similar to developmental research and covers a wide field.

Types of instruments used in work under the first head are of a more or

Instruments are Employed Laboratories *available for certain types developmental research*

DENHAM

less standard nature. In many cases special instruments and test equipment represent developments of similar commercial instruments although in a number of cases new instruments have had to be developed for special purposes.

By far the largest proportion of the work of research laboratories and proving grounds is devoted to the second classification, that of developmental research. This type of work is applied to every part of the car, from the carburetor to the springs and from the upholstery material to the headlights. For

necessitated by the increased standards of performance set in recent years. Not the least important of these is that of proper braking. The general procedure is to make comparative studies of existing types of brake, deducing therefrom the most logical procedure to be followed in working out and putting into effect further improvements.

To study the efficiency of brakes a variety of deceler-

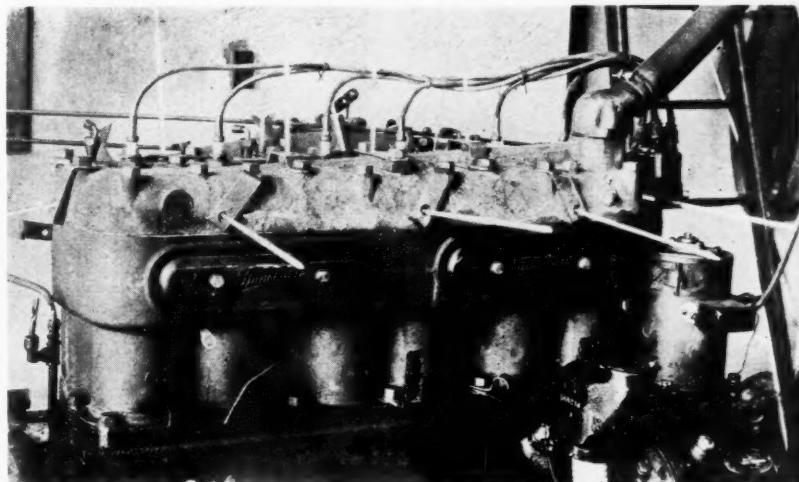


Fig. 3—Determination of proper cylinder block port sizes to obtain desired head temperatures at all points is difficult to do theoretically. Studebaker does it by varying port openings by means of the head gasket until the correct combination is obtained

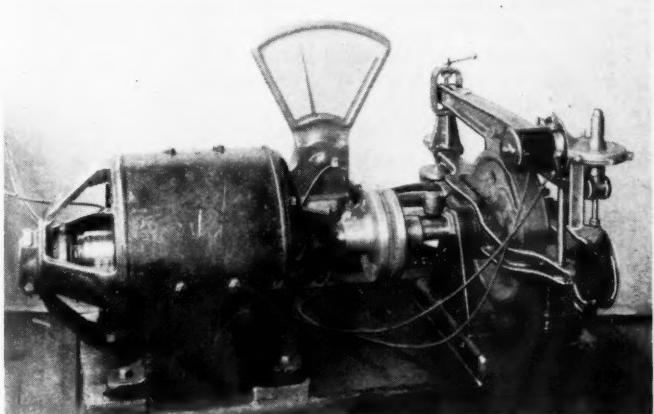


Fig. 4—Life tests of brake lining must be carried on so as to give strictly comparable results. In this device used by Dodge Brothers the load is maintained constant at all times as explained in the article

this type of work only a small number of standard instruments have so far been developed, each laboratory depending largely on the ingenuity of its engineers for the development of apparatus and instruments for performing tests as the necessity arises.

One of the most vital problems which face the research engineer is that of improvement in car design

ometers are used. One of the most interesting of these is a recent development by the Studebaker Corp., illustrated in Fig. 1. It consists of a series of exhausted glass tubes partially filled with mercury. Under deceleration the mercury will surge forward and up into tubes, closing an electric circuit by contact with a platinum electrode.

Each of the electrodes, one for each tube, is connected to a counter set to register in half seconds, timed by a master counter which in turn is regulated by a calibrated clock mechanism. Since the tubes can be tilted, the height to which the mercury has to rise before closing the circuit can be varied and adjusted for a definite figure of deceleration in feet per second. A reading of the counters following a brake application indicates the number of half seconds at each rate of deceleration. The tubes are provided with restrictions to form a damping action for the mercury flow. With modifications these tubes could also be used for acceleration studies.

Since all comparative performance tests are dependent for their accuracy on the method of tuning the engines, etc., some standard tuning method has to be evolved. At the various proving grounds this is done

by means of chassis dynamometers. In order to determine the best carburetor setting a flowmeter is generally used. One of these, developed by the Marvel Carburetor Co., consists of an Autopulse pump delivering fuel to a constant level bulb connected to a glass tube, the bottom of the latter being connected to the carburetor. To obtain maximum fuel economy at maximum power the carburetor setting is varied until the gasoline in the glass tube of the flowmeter is at its highest point without a dropping off in power. This method eliminates time-consumption readings and is made quite sensitive by the provision of variable jet sizes for the

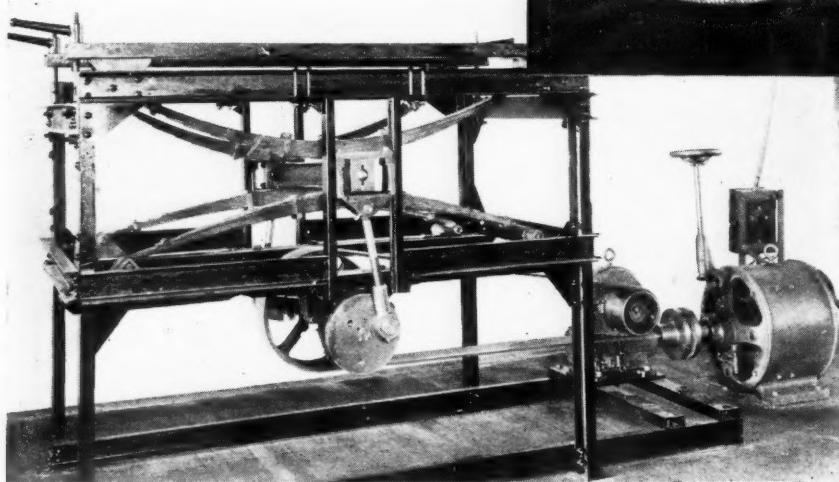


Fig. 6—This original set-up is used by Studebaker for life testing of car springs as well as determining their deflection characteristics

outlet of the glass tube, at the carburetor connection. A considerable variety of methods have been developed in an attempt to directly determine the brake horsepower through measurements of torque reaction. One method consists in placing a scale under the front wheels of a car mounted on a chassis dynamometer. The change in weight on the front axle theoretically is a measure of the power, determined by measuring the effective torque arm. With this method proper damping is difficult. Another method which seems to hold considerable promise is that of the torque meter under development by the Studebaker Corp. This consists of a box containing four bevel gears mounted in the propeller shaft line, connected at the front to the front universal flange, and at the rear through a universal joint to the shortened propeller shaft. The idler gears are mounted on a cross shaft attached to the box, the latter being provided with a transverse arm connected through a hydraulic element to the frame of the car. Since the direction of propeller shaft rotation is reversed, through the torque meter, the actual reading would give twice the torque reaction, but the hydraulic element is so designed as to reduce this by half, giving the exact torque reading and also providing a damping action.

Hill climbing ability is another factor of car performance which has grown increasingly important of late. The usual method is to take a standard grade and measure, by stop watches, the time required for the climb, starting from a predetermined speed, as well as the distance of climb up to a stall. This method,

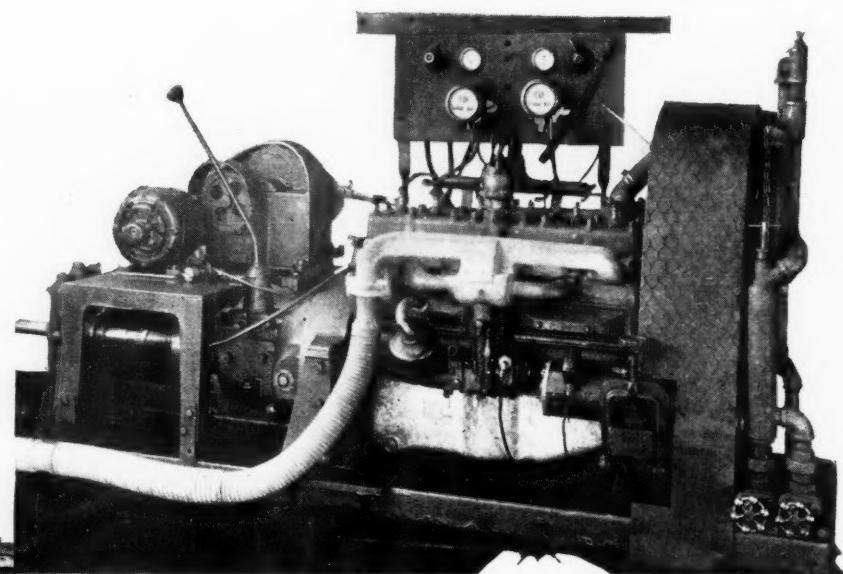


Fig. 5—Clutch lining gets its hardest wear during engagement and acceleration. This device at Dodge Brothers automatically kicks out the clutch, lets it in, accelerates the engine, etc., once every minute

however, has an inherent defect, in that it does not indicate car operation during the climb. To overcome this, several methods are being worked upon, the two most promising being the application of different electro magnets at definite distances along the test route, and through the registration of a light beam on photoelectric cells, also at definite intervals on the hill. In either case amplification devices are necessary between the device in which the current is induced and the registering timer. In addition to the advantage of giving definite performance data for each section of the hill climb, etc., any such device has the advantage of eliminating the human element, by doing away with the stop watch.

Eliminating Stop Watches

The natural tendency to reduce errors through the elimination of the human element is found to be gaining headway in many other lines of research work. Wherever possible stop watches are being eliminated. As an example there might be cited a new fuel consumption device developed at one of the proving grounds. This device consists of a tank containing the fuel, in the bottom of which is mounted a fuel pump which forces gasoline up through a calibrated gas tube, overflowing at the top and returning to the tank. A fifth wheel speedometer device is used in conjunction with this device. It is provided with a small motor which operates a counter geared to register 30 times to a mile. The tube in the gasoline container contains one-thirtieth of a gallon, so that fuel consumption readings are directly in miles per gallon. To take a fuel consumption reading a switch is turned on by the driver, which shuts off the flow from the fuel pump, the gasoline feeding direct from the tube. At the same time the switch also starts the counter. At the bottom of the tube a float device is installed, which automatically shuts off the counter and returns the automatic fuel recorder to its normal operation. It is then only necessary to read

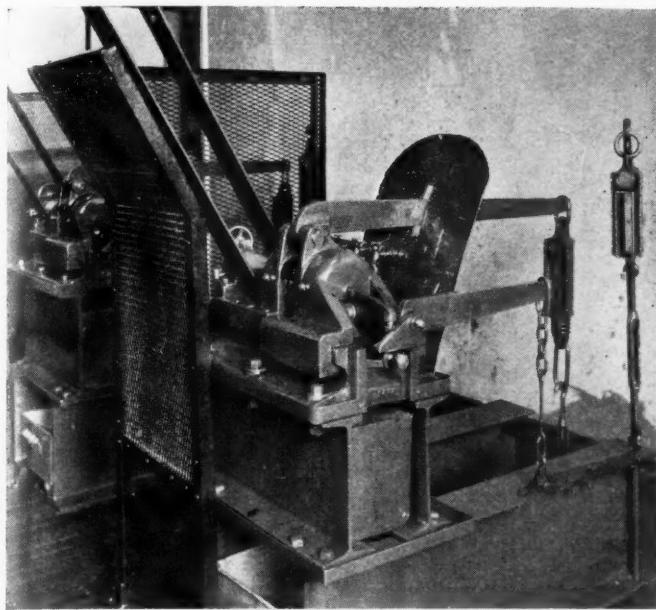


Fig. 7—This ball bearing life test at Studebaker has provisions for establishing definite radial and thrust loads

the counter in order to determine the rate of fuel consumption.

One of the problems which has recently developed to a position of considerable importance is that of structural rigidity. The latter depends not only on the rigidity of the body itself but also on the rigidity of the frame and the inter-relation of the two. To determine the various influencing factors each one must be studied separately.

Measurements of Frame Rigidity

To do this the Studebaker Corp. first measures the rigidity of the car as a whole. A section of the floor in the laboratory is provided with a large number of T-slots, so arranged that any car or truck can be tested. Three corners of the vehicle are anchored to these T-slots and a jack is placed under the fourth, the force of the jack and the deflections being measurements of the car rigidity. In attempting to work out what frame characteristics are most contributory to rigidity, Studebaker first worked with a large number of full scale models. Due to the high cost and long time required for such studies, this was later superseded by an ingenious method consisting of building up frames from cardboard, using sealing wax for cross-member joints. While this method, of course, does not give exact quantitative results for actual frames, the comparative picture thus obtained was found to be very accurate after a check on full scale models.

Another factor in body rigidity is that of fender wobble. To study amplitude for comparative results, the Studebaker Corp. uses the devices shown in Fig. 2. This consists of three counters mounted in a frame on the front of the radiator and connected, as shown, to the fender tie rod. The counters are set to register for various predetermined amplitudes, reading of the counters thus also indicating the approximate maximum amplitude. A more accurate result is possible, if desired, by resetting the counters for different amplitudes following the preliminary tests.

For much of the developmental research work carried on in various laboratories it is not possible to provide instruments. A characteristic example is the Studebaker method of adjusting the water flow through

engines to obtain balanced head temperatures. This is done by enlarging all ports in the experimental engine as far as possible and then using a cylinder head gasket to place restrictions in the water flow as desired, by varying the port openings. Thermometers are inserted in various parts of the head as shown in Fig. 3 and the restrictions are varied so as to obtain the desired temperatures in all parts of the head. Of course, the engine is run at the same time and the inlet water is maintained at a definite temperature.

Life Tests of Parts

Life tests of various car parts are carried out even more expensively than development tests in the automotive field. Practically every factory is doing work of this kind, and much of the routine work of the research laboratory is devoted to these tests.

Brake lining is tested at Dodge Brothers by the ap-



Fig. 8—Front end chain life test equipment used by Studebaker

paratus shown in Fig. 4. This consists of a drum rotating at 6000 r.p.m., being of the same material and finish as production brake drums. On top of this drum rests a shoe to which is riveted a section of brake lining. The shoe is attached to the cross arm, one end of which rests on a scale set for a definite load. If the load increases due to a change in the friction coefficient and the platform of the scale is depressed in consequence, an electric circuit is closed which operates a small reversible motor. This in turn operates a screw mechanism at this end of the arm, raising it and decreasing the load. If the load decreases, another electric circuit is closed which causes the motor and the screw mechanism to turn in the opposite direction to lower the arm and increase the load. A micrometer dial gage is provided on the shoe to permit readings being taken at any time of the amount of wear that has occurred on the lining.

Clutch Disk Testing Apparatus

Dodge also makes use of an interesting clutch disk testing installation. As shown in Fig. 5, this consists of a production engine driving a standard clutch and, through a standard transmission, a club outside the laboratory designed to absorb the maximum horsepower of the engine at 1600 r.p.m. At the side of the machine is a $\frac{1}{4}$ hp. synchronous motor running at about 1800 r.p.m. and driving an eccentric through a reduction of about 1800 to 1. This eccentric depresses the clutch about once every minute, at the same time closing the throttle to an idling speed of 500 r.p.m. It

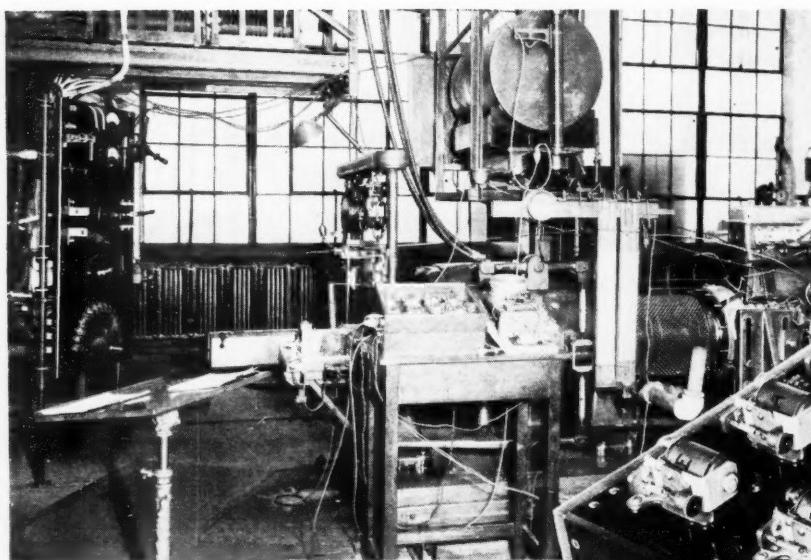
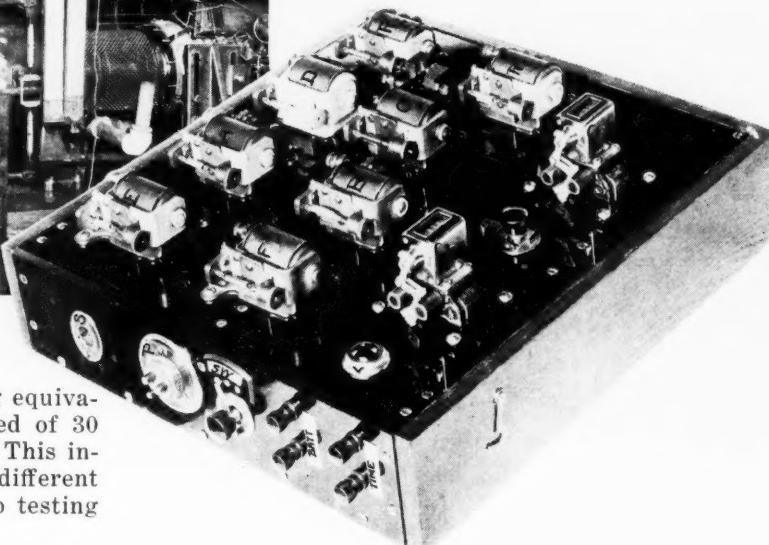


Fig. 10 (a and b)—Set up for an endurance test of a truck motor used at the White Motor Co., and the timing instrument used for measuring fuel consumption



thus reproduces normal operating conditions including acceleration at full throttle from idling speed up to 1600 r.p.m., the latter being equivalent with this type of engine to a road speed of 30 m.p.h., the entire operation being automatic. This installation can be used for life-tests of many different engine and transmission parts, in addition to testing of the clutch.

Life-Testing of Springs

Several original methods of life-testing various car parts are also found at Studebaker. Fig. 6 shows an installation developed for life-testing of car springs, as well as the studying of deflection characteristics. It consists briefly of a frame work to mount on the springs, and two eccentrics which alternately compress and release the springs through the means of an I-beam cross bar, the eccentrics being belt-driven from a 3-hp. motor with an intermediate worm gear reduction. The speed at which this installation can be operated is limited only by the rigidity of the springs and the frame work.

Fig. 7 shows a Studebaker installation for life tests of anti-friction bearings. The two arms shown are for the purpose of providing radial and thrust loads on the bearings, the loads being variable through the provision of turnbuckles, the scales shown giving the load reading. The installation is belt driven and includes an oil pump for lubrication. It is possible, of course, to mix small amounts of dirt and grit in with the oil in case it is desired to determine their effect on the bearings. Fig. 8 shows the Studebaker installation for life-testing front end chains, with cover removed. The gages shown are for reading the oil pressure and speed. A tension adjustment is provided for use if desired.

Even cushion springs and upholstery materials are now being life-tested. The installation shown in Fig. 9 (on opposite page) is used at Studebaker.

Truck Engine Tests

That developmental research work is not confined to manufacturers with high production schedules is shown by the fact that even in the truck field we find considerable work of this nature being carried on. In truck work, of course, engine tests of many hours' duration are of vital importance, and some form of automatic or semi-automatic recording device is essential for reporting fuel consumption and speed. Fig. 10-a shows an interesting set-up for this purpose used by the

White Motor Co. Fuel consumption is measured by weight rather than by volume. When the gasoline scale beam drops an electric contact is made which starts two counters of the instrument, shown in Fig. 10-b. One of these is operated from the laboratory clock and registers seconds or half seconds, while the other operates from the dynamometer shaft, counting revolutions. After the start the observer moves the poise on the scale back the desired number of pounds and moves the switch on the face of the instrument to the second point. The next time the beam falls, both time and revolution counters are stopped and two alternate ones are started. After the counter readings are recorded the poise is moved back again and the switch returned to the first point, the operator then waiting for the beam to drop again. Minor refinements in the instrument include a warning light which burns as long as the switch is on the wrong point, and a signal which burns as long as the scale beam is down, as a further warning. The contact on the scale is connected with the outlet *P. S.* is for connection to the signal lamp or bell. *C₁* and *C₂* are the time counters, the remainder of the instruments being relays for operating the various circuits. The accuracy of the instrument, of course, is dependent on that of the laboratory clock. Its application is not limited to measurement of fuel consumption but includes all tests involving time.

Of course, many of the tests which are performed by the truck manufacturers are applicable also in the automobile field. An example of this is shown in Fig. 11, which represents a life test for headlight switches made at the White Motor Co. As shown, two eccentrics driven through a worm gear reduction from an electric motor close switches by means of parallel bars. A counter is provided which registers the number of times the switches are operated. When a light goes out it is a sign that the switch has failed.

Fig. 12 illustrates another item of simple and effective test equipment. It is an installation used at the

Fig. 11—The White Motor Co. uses this set-up for life testing of headlight switches

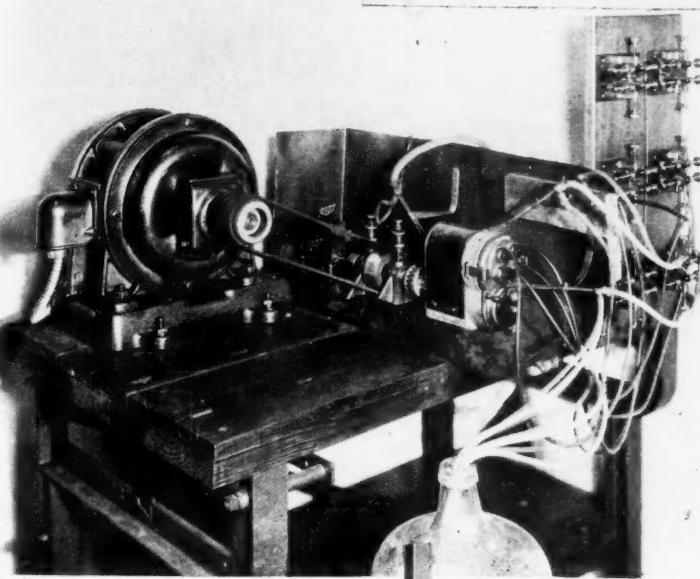
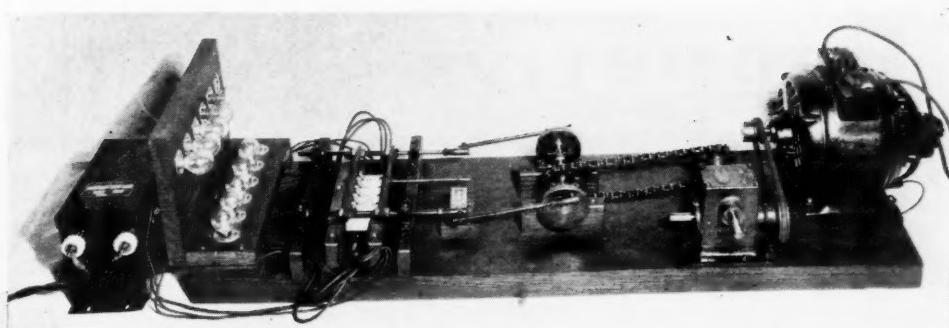
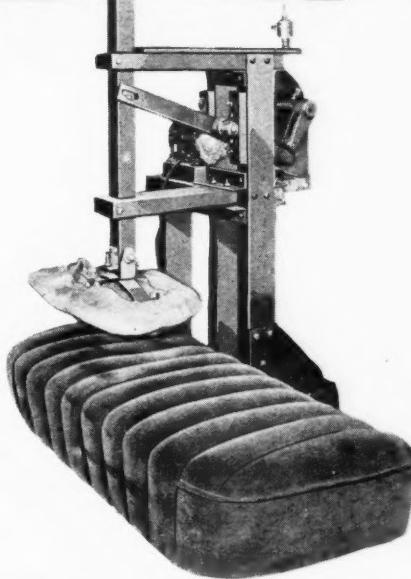


Fig. 12—White Motor Co., test of magnetos for waterproofness, using DeVilbiss sprays

Fig. 9—Cushion springs and upholstery materials are life-tested at Studebaker with this rig, imparting a pounding motion



White Motor Co. to test the "water-proofness" of magnetos. The rubber tubes shown are fitted with nozzles which are directed at various critical parts of the magneto. Each nozzle (a standard DeVilbiss spray nose) has two tube connections, one to a source of low pressure compressed air, the air stream sucking water out of the container shown.

Airplane Engines

(Continued from page 956)

mental work on water-cooled engines has been carried on mainly in the larger sizes, from about 600 hp. up.

Practically the entire production of these goes into Government service, where high speed operation and the requisite low frontal area are often essential.

It is probably safe to say that at present water-cooled engines are in a higher state of development than the air-cooled types. In principle, water-cooled aircraft engines do not differ materially from the usual automotive type, except that in aircraft work in-line engines are the exception rather than the rule, and interchange of information with the automotive industry has greatly aided the development of this type of aircraft engine.

The favorite water-cooled engine is a 12-cylinder V-type with variations permitting it to be mounted in an inverted position. Leading manufacturers of such engines are the Curtiss Aeroplane & Motor Co., Inc., and the Packard Motor Car Co. While the Curtiss company still produces its C-6 six-cylinder in-line engine of war-time origin, it is concentrating more largely on its model 1550, called the "Conqueror." The latter is a development of the well known Curtiss D-12 but develops 725 hp. at 2400 r.p.m. with a dry weight of 755 lb.

While the Packard Motor Car Co. manufactures several different sizes of engines, its most interesting recent development is the "X" engine which develops 1250 hp. at 2700 r.p.m. and has a dry weight of 1500 lb. This engine is composed of four banks of cylinders taken from the Packard 1500 engine, mounted on a barrel-type crankcase of very rigid construction which serves also as engine bearers. The crankshaft is of very interesting design, the crank arms themselves forming the main bearing journals.

At the present time the water-cooled engine is more promising than the air-cooled type from the point of view of high specific output. This is due to the fact that the output per cubic inch of the air-cooled engine is limited mainly by the sizes and capacity of the cooling fins. In water-cooled engines compression ratios of 10 to 1 have been successfully used in experimental designs, and the fuel consumption has been forced down to as low a figure as 0.33 lb. per hp.-hr.

Steam cooling has been successfully applied to engines of the water-cooled type, especially the Liberty, and it is not improbable that this cooling system will become popular first in the aircraft field, in view of the fact that quick warming up is essential in aircraft operation and the reduced cooling area with this system also results in a reduction of the frontal area or, in the case of wing radiators, of skin friction.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

June 23, 1928

Heavy June Retail Sales Reduce Dealer Car Stocks

PHILADELPHIA, June 23—Heavy retail movement of new and used automobiles gives promise of bringing deliveries in June to the highest point for the month in recent years. In view of the rather heavy stocks of cars in dealers' hands at the start of the month this large sale should bring retail stocks to satisfactory position by mid-year, a condition toward which the industry has been aiming by the gradual tapering off of manufacturing operations during the past two months.

Production in June will show considerable decrease from earlier months, but the total in the main will be held high by the gradually increasing Ford output and by the continued high operations of a number of the smaller producing plants whose models have been in large demand throughout the first half of the year.

The first of the new model announcements by a major producer is being made this week and will be followed at intervals during July and August by a few other large producing companies. The new car presentations of the summer months promise to outrank in importance the announcements usual at this season and should have the effect of bringing summer sales to an unusually high point.

Better Parts Marketing Needed, Service Men Told

TORONTO, June 19—"Many of the factory parts marketing plans in effect today compare with the automobiles of 15 or 20 years ago," said A. R. Sandt, sales section, General Motors Corp., in an address before the factory service managers' forum of the National Automobile Chamber of Commerce which opened a three days' convention here yesterday. Mr. Sandt's address, "Service Parts Marketing," called forth considerable discussion from the record attendance relative to the necessity of furthering the distribution of factory parts and it was generally conceded that before these can be made available to all who require them, there is still preliminary work to be done with regards to discounts and advertising.

Zapon Buys Duratex

STAMFORD, CONN., June 18—Richards & Co., owners of the Zapon Co., has acquired the Duratex Corp. of Newark, N. J., and will continue its operation under the same management.

Celoron on Three Shifts

PHILADELPHIA, June 17—Celoron Co. reports production lines now operating on three shifts daily, six days a week. June sales show a considerable increase over May.

M. & A.M.A. Index Near Record in May

NEW YORK, June 20—Activity in the parts and accessory business during May continued unusually brisk and established a second high month in grand index for business handled. The grand index for the month was 201 based on January business of 1925 as 100, according to figures compiled by the Motor & Accessory Manufacturers Association. This compares with index of 195 for April this year and with 172 for May, 1927. The only month which exceeded this figure was March of this year when the grand index reached 207.

Original equipment index was 215 as compared with 213 in April and with 184 in May of last year, and is also the second high month recorded since this method of indication has been adopted. The previous high was March this year when the index reached 231.

Index for replacement parts, which has grown steadily since the beginning of the year, established a new record at 185 as compared with 151 in April this year and with 123 in May, 1927.

Accessories continue fairly inactive but showed a gain over April, establishing an index of 113 as compared with 107 in the previous month and with 113 in May last year.

Service equipment has shown a steady decline since the beginning of the year and its index was 157 as compared with 164 in April and with 192 in May last year. Some firms manufacturing service equipment, however, report improvement in their individual cases. Every indication points to June being also a very good month although some slight recession is expected.

Find Oil in New Zealand

NEW YORK, June 17—Word has been received here of the discovery of crude oil by German geologists investigating New Zealand. The oil has been found in extensive commercial quantities over an area of 400 acres around New Plymouth. Drilling is proceeding in another area near Gisborne.

San Francisco Burns 20 Junk Cars Weekly

SAN FRANCISCO, June 18—The \$25 to \$50 machine will be a thing of the past on the highways of this section, if the Motor Car Dealers Association of San Francisco can have its way. Once a week a shipment of decrepit automobiles is made from San Francisco to Oakland, where a junk company is under contract to burn all of them, salvaging only the remaining metal, and saving none of the parts. These shipments average 20 cars each, and are made by a group of dealers who have agreed to absorb such loss as may accrue in getting these "wrecks" off the highways. According to Arthur D'Ettel, business manager of the association, the practice will be continued.

Highway Trailer Absorbs Continental Axle Company

MILWAUKEE, June 16—The Highway Trailer Co., Edgerton, Wis., has increased its capital stock to \$1,000,000, following the absorption of its subsidiary, the Continental Axle Co., also of Edgerton. The new capital structure consists of 1800 shares of common and 8200 shares of preferred, each with \$100 par value. The Continental company's product always has been applied entirely on the Highway trailer account. James W. Menhall has been president of both corporations and continues at the head of the Highway company. Extensive additions have been made to the plant and equipment in recent months, and further enlargement is contemplated to meet the increasing demand for trailers for municipal and industrial hauling.

Henney Gets Contract

CHICAGO, June 18—The contract for ambulances for the United States Veterans' Bureau has been awarded to Henney Motor Co. of Freeport, Ill. Twenty-one manufacturers entered the competition. All bidders were forced to submit a sample ambulance by the Bureau of Standards.

Stearns Sales Gain 163%

CLEVELAND, June 18—Stearns-Knight Sales Corp. reports May shipments exceeding May, 1927, by 163 per cent. The company entered June with a record number of orders on its books.

A.E.A. Gives Assent to M.&A.M.A. Merger

New Organization Would Have Manufacturer and Jobber Members

MACKINAC ISLAND, June 20—Consolidation of the Motor & Accessory Manufacturers Association and the Automotive Equipment Association overshadowed all other activities at the thirteenth annual summer meeting of the A.E.A., now in session here. The proposed amalgamation was approved unanimously by both the manufacturing and wholesaling wings and a tentative organization set-up providing for what virtually amounts to a federated association of three distinct membership groups was adopted.

Briefly the combined associations will consist of three classes of membership as follows: (A) Manufacturers selling for original equipment; producers of raw materials; manufacturers of machinery or tools sold to manufacturers. (B) Manufacturers who distribute through wholesale channels only, or manufacturers who distribute through wholesale channels and sell also for original equipment. (C) Wholesale distributors.

Each division of the membership is to be headed up by nine councillors—27 in all to be elected by the membership. These councillors would control the division from which they are elected. The general administration of the association is to be controlled by a board of governors consisting of three councillors from each division. The association also provides for president, vice-president, secretary and treasurer and the necessary committee and administrative groups. Dues are to be paid on a sliding scale based on volume of sales.

The A.E.A. members in unanimously approving the amalgamation feel that it is in step with modern trend in business and in association work; that it will effect an appreciable economy while providing broader opportunities for co-operative marketing activities of its members. Committees from both associations will meet soon to arrange the details and it is hoped that the project will become a reality on or before Sept. 1.

Approve Marketing Work

Greater market development in which the A.E.A. has been active for 18 months, although little in the way of actual accomplishment was physically possible until six months ago, was given an almost unanimous approval and Harry G. Mooock drew enthusiastic applause when he presented the results of his efforts. However, it was the feeling of the organization generally, that it must operate for the time being on a somewhat curtailed budget. The membership created a schedule of dues which will provide only \$130,000

instead of more than \$300,000 anticipated but not spent in the past year's activities of that department.

A new set of by-laws was adopted which places most of the authority formerly exercised by the commissioner with an executive committee; makes the president instead of the commissioner the presiding officer of the conventions and the executive officer of the association, and provides for some changes in the employed administrative officers including the substitution of a general manager or executive secretary for the commissioner.

Chrysler 1928 Sales Estimated at 250,000

NEW YORK, June 20—Chrysler Corp. estimates that sales of cars in 1928 will total 250,000 as against 192,083 in 1927. Sales for the first half of this year will exceed the total output of 1925, according to a review which has just been compiled. Earnings for the four months ended April 30 after all charges amount to \$7,896,506 as against \$6,852,366 for the first four months of last year, an increase of 15.2 per cent.

Since the beginning of 1925 and up to April 30 of this year, the Chrysler Corp. has invested \$22,777,754 in additional plant and properties. Depreciation has been charged off so generously that gross property value as of April 20 is placed at \$23,131,877.

Exports during the period covered by this report increased from 6.02 per cent of the total factory output in 1924 to 15.78 per cent in 1927. Last year Chrysler shipped 11.17 per cent of the total gross exported by the automobile industry in this country as against 8.83 per cent the year before. In dollar volume Chrysler export business amounted to 14.56 per cent of the total sales and for this year to date the percentage is 15.23.

Wire Wheel Sues Ford

MILWAUKEE, June 19—A suit against Ford Motor Co. charging infringement of the Cowles patent was filed in the Federal Court here yesterday by the Packard Motor Car Co. and the Wire Wheel Corp. of America, joint holders of the patent rights. The suit seeks an injunction preventing further use of the wheel and an accounting of all profits made on its manufacture.

Hennecke Forms Buying Alliance

NEW YORK, July 19—Automotive Alliance, Inc., has been organized by Earle V. Hennecke, former vice-president and general manager of the Moto Meter Co. and past president of the Automotive Equipment Association. This alliance is a group buying organization for wholesalers.

Rubber Trading Stronger

NEW YORK, June 18—Reduced tire prices have resulted in stimulation to trade in the crude rubber market.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co.

NEW YORK, June 21—Liquidation in the stock market acquired added momentum last week, transactions on June 12 reaching the record total of 5,200,000 shares. After a temporary recovery, the downward movement of values was renewed.

FEDERAL RESERVE REPORT

Security loans outside of New York also declined during the same period, total loans and discounts of reporting member banks rising only \$27,000,000, notwithstanding an advance of \$82,000,000 in "all other" (mainly commercial) loans. Bills rediscounted with the Federal Reserve banks continued to increase, the total exceeding \$1,000,000,000 for the first time since early in 1922. The sale of government securities by the reserve banks, however, was discontinued, temporarily at least, and this item showed the first increase in eleven weeks.

GENERAL TRADE

Unfavorable weather again interfered with trade, especially at retail, in several parts of the country last week. Retail trade reports for May, on the other hand, are more encouraging than those for April. Sales of 525 department stores reporting to the Federal Reserve system were 4 per cent larger than a year ago, though the gain was attributed mainly to the extra business day in May this year. The business of two leading mail-order houses was 18.8 per cent greater than in May, 1927, while 35 chain-store systems reported a gain of 21 per cent during the year.

POWER CONSUMPTION

General industrial activity, measured by consumption of electrical energy by 3000 large manufacturing plants in the United States in May, according to the *Electrical World*, was 0.2 per cent, lower than in April and 1.3 per cent below the rate in May last year. This is the first time since September last that the current rate has fallen below that of a year earlier.

FREIGHT CAR LOADINGS

The volume of railway freight traffic, however, reflects some improvement in distributive activity. Car loadings in the week ended June 2 were more numerous than a year ago, showing the first increase over last year's figures reported in many weeks.

FOREIGN TRADE

A distinct improvement occurred in foreign trade in May. Both exports and imports of commodities were larger than in April of a year ago. Exports were, in fact, the largest since last November. The export balance for the month was \$68,000,000, which compares with \$18,000,000 in April and \$47,000,000 a year earlier. For the 11 months of the fiscal year to date, however, both exports and imports are somewhat smaller than in the corresponding period last year.

Nash Senior Lines Have Twin Ignition

Higher Compression Ratios Feature All Models—Body Lines Are Redesigned

KENOSHA, June 21—Nash Motors Co. today introduced its 1929 line of cars, displays being made in all dealer showrooms throughout the country. The new series feature a redesigning of the company's three lines, the Advanced, Special and Standard sixes, the outstanding mechanical change being the introduction of twin ignition and alloy pistons on its Advanced and Special six lines, while externally the lines of the cars have been refined.

A top speed of 80 m.p.h. in the Advanced Six and of 75 m.p.h. in the Special Six has been made possible by higher compression ratios, invar-strutted Bohnalite pistons and the improved ignition. A top speed of 70 m.p.h. in the Standard line results from use of the invar-strutted pistons, and higher compression, this line not having the new ignition system. The compression ratio throughout the new series is 5 to 1 as against 4.35 to 1 formerly.

In the twin ignition system, one plug fires in the top and another in the side of each combustion chamber, a six-lobe cam, double breakers and two coils are utilized. Aircraft type metric plugs are used.

Bore and stroke remains the same in all three engine groups, the valve-in-head engine continuing in the senior lines and the L-head continuing in the Standard. The seven-bearing crank-shaft continues in all models. The frame has been redesigned to allow roomier rear seat arrangement.

Transmission is Redesigned

The transmission has been redesigned to give higher speed in second-gear. The gear shift lever now is mounted on the sloping top of the clutch housing and its lower end curved in a perpendicular position to make contact with the shift bars which are extended forward into the clutch housing.

Bijur chassis lubrication is used in the Advanced Six and Alemite in the Special and Standard lines. Wheelbase on the Advanced Six is 130 in. for five models and 121 for two. Wheelbase in the Special Six is 116 in. and 112½ on the Standard.

Satin finished hardware is used throughout on the bodies. In the Advanced Six a folding center arm rest is provided. Cabriolet tops have been redesigned to permit of a smaller fold when down. A new nameplate, combined with a new radiator shell and cap changes the front appearance.

Standard equipment includes front and rear bumpers, chromium plated headlights and radiator shell, built-in trunks on three models, Houdaille shock absorbers on the senior lines and Lovejoy on the Standard.

Prices on Nash Line Range \$885 to \$2,165

Standard	
Four-door sedan	\$955
Collapsible cabriolet	955
Two-door sedan	885
Coupe	885
Four-door landau sedan	995

Special	
Two-door sedan	\$1,260
Coupe	1,245
Rumble seat coupe	1,315
Four-door sedan	1,345
Collapsible cabriolet	1,345
Four-pass. Victoria coupe..	1,345

Advanced (121" Wheelbase)	
Two-door sedan	\$1,480
Four-door sedan	1,550
(130" Wheelbase)	
Coupe	\$1,775
Collapsible cabriolet	1,660
Seven-pass. sedan	1,990
Seven-pass. Imperial sedan	2,165
Four-door landau sedan....	1,925

Dodge Brothers Sales 102,558 in 5 Months

DETROIT, June 16—Dodge Brothers, Inc., reports that export of units from all its plants in the United States and Canada, in May, totaled 3814, a gain of 568 or 17.5 per cent over May, 1927, when 3246 units were shipped.

Dodge Brothers, Ltd., of Canada, reported the best month in its history during May with shipments of 1371 passenger cars and trucks; the best previous month being May, 1926, with a total of 1341.

Dodge Brothers reports total shipments of passenger cars and trucks from all its plants during the first five months of this year of 102,558 compared with 83,781 in the corresponding period of last year. Shipments for June indicate that these substantial gains over 1927 will be maintained for the first half of the year, both in passenger car and commercial car sales.

Marmon Passes 1927 Total

INDIANAPOLIS, June 18—Marmon Motor Car Co. production in the first five months of this year has equalled the total for all of 1927. June sales are showing an increase corresponding to the previous monthly gains this year, and sales abroad are averaging 300 per cent ahead of last year.

Hayes Gets Marmon Contract

DETROIT, June 18—Hayes Body Corp. of Grand Rapids has contracted to supply automobile bodies for Marmon Motor Car Co., according to Hal H. Smith, vice-president, who also states that deliveries on Chrysler models will begin the last week of the current month. Mr. Smith predicts that June production will equal May output.

Ford Total Expected 5000 Daily in July

Output in United States Now 2800 a Day—Observes 25th Anniversary

DETROIT, June 16—Production of Ford Motor Co. is advancing slowly, Edsel Ford said this week. Asked when the company expects to reach an output of 5000 units a day, which previously had been set for July 1, Mr. Ford said it is now believed that the company will attain this mark some time during July.

Production in all the company's plants in the United States is averaging between 2800 and 3000 units a day. One high day slightly in excess of 3000 cars was reported.

The Ford company continues to add men to its payrolls and the number now employed in the three plants in Detroit totals 117,200, which exceeds by 7200 the previous high mark set in 1926 when 110,000 were at work producing 8700 of the Model T's daily. The number of employees added during the week at the Detroit plants totaled 876 and the workers are divided among the plants as follows: Fordson, 78,515; Highland Park, 33,973, and Lincoln 4712.

The Ford company celebrated its twenty-fifth anniversary today. The company employed 311 men and built 1708 cars its first year.

Milwaukee Ford Makes Bodies

MILWAUKEE, June 16—with the reopening of the Milwaukee Ford plant after a period of one year and three days, on June 11, the manufacture of closed bodies has become one of the operations. Heretofore all enclosed bodies for chassis assembled at Milwaukee were shipped from Detroit. By July 1 a payroll of 600 is contemplated, with an output of 300 cars a day scheduled. The five-day, 40-hour week prevails.

Pierce Plans Carburetor Control

ANDERSON, IND., June 18—The Pierce Governor Co. has moved its factory and executive offices into the new plant here. The plant was acquired several months ago from the R. J. Wright Mfg. Co. and has been completely rebuilt by the Pierce company. It is understood the company plans manufacture of new equipment to provide automatic control of carburetion, eliminating the need for hand choking.

I.H.C. Increases Facilities

MILWAUKEE, June 16—the buildings and real estate of the Northwestern Malleable Iron Co., one of the oldest and largest foundry concerns in the Northwest, have been purchased by the International Harvester Co., as an addition to its Milwaukee works, which adjoins the Northwestern works.

General Employment Shows May Increase

Industry Gains 5.7 Per Cent
Over April—Payrolls
Rise 4.1 Per Cent

WASHINGTON, June 21—A marked upward trend in employment and payroll totals in the automotive industry is noted for May by the Department of Labor.

A reduction of 0.2 per cent in employment and an increase of 0.2 per cent in payroll totals during May as compared with April, 1928, in industry in general is reported by the department on data based on reports made by 11,035 establishments in 54 of the principal manufacturing industries. These establishments in May had 3,055,200 employees with combined total earnings in one week of \$82,814,127.

The automobile industry reported an increase of 5.7 per cent in employment and of 4.1 per cent in payroll totals during May as compared with April. Compared with May, 1927, the automobile industry increased employment 14.2 per cent last month.

Per capita earnings in May, 1928, were 0.5 per cent higher than in April, 1928, but 1.1 per cent lower than in May, 1927.

An optimistic view of the employment situation generally is taken by the department which states that increased requirements for farm help are absorbing a large number of workers previously reported unemployed.

Following are telegraphic reports received by the Department of Labor from leading automotive and allied industrial centers:

Michigan. Factory employment somewhat improved; especially in automobile industries. Detroit—All automobile plants operating; two factories running two shifts. Flint—All industrial plants in operation with two automobile factories employing double shifts in certain departments. Lansing—Several large automobile factories operated on overtime schedules. Building projects include \$750,000 automobile body factory. Volume of employment in May larger than for same month in several years. Bay City—Erection of \$1,500,000 automobile factory being rushed.

Ohio. Considerable unemployment at close of May. Cleveland—automobile industry operating at about 80 per cent capacity. Lima—Overtime operations reported in plant manufacturing automobile bodies.

Massachusetts. A general surplus of workers in Haverhill industrial district is reported; particularly noticeable in automobile body plants. One tire-fabric plant in Fall River and two such plants in New Bedford, however, working overtime.

New York. Employment in automobile and allied factories remained at a high level and a number of automobile plants operated on overtime schedules. Buffalo—Large forces employed in automobile and allied factories except one accessory plant reporting a slight decrease. Syracuse—Automobile industry employment shows steady increase; several automobile plants on overtime schedules.

Stutz Takes Second in Whitworth Race

PARIS, June 19 (by cable)—A Stutz touring car driven by Brisson and Bloch finished second in the Rudge-Whitworth 24-hour race at Le Mans, covering 1594.2 miles and breaking the former record by eight miles. A Bentley car driven by Barnato and Rubin took first place with 1658.6 miles. Two Chryslers competing scored 1559.4 miles and 1498.8 miles respectively.

Thirty-three cars were entered in the race which was closely contested throughout. The Stutz car trailed three Bentleys for four hours and then took the lead and held it for six hours. Time lost for brake adjustment affected the Stutz chance for first. Sixteen cars finished.

Briggs & Stratton Buys Evinrude Motor Company

MILWAUKEE, June 16—The Briggs & Stratton Corp., manufacturer of automotive electrical units, controls and other equipment and small gasoline engines, has taken over the Evinrude Motor Co., Milwaukee, the pioneer manufacturer of outboard motors for rowboats and canoes, by the acquisition of its entire common stock. According to an announcement by Stephen F. Briggs, president of the Briggs & Stratton company, the Evinrude company will continue operations in its present plant with the same management as heretofore. August J. Petrie is president. The Evinrude product is being developed in its application of the engine to other purposes besides outboard units, to operate pumps for fire protection at summer homes and other isolated places, lighting systems, etc.

To facilitate the handling of its steadily increasing business, Briggs & Stratton is adding an additional story to its main shop. About \$50,000 will be invested in the addition.

Moreland Denies Merger

BURBANK, CAL., June 16—Report of merger negotiations between Kleiber Truck Co. and Moreland Motor Truck Co., both of California, were denied by Watt L. Moreland, president of the Moreland company, who said no merger is under consideration or contemplated.

Jordan Sales Increasing

CLEVELAND, June 16—Dealers staging a driveaway from the Jordan Motor Car Co. plant reported sales now beyond expectations after a slow start earlier in the year. This was attributed to generally improved conditions in most other lines of business.

Atlanta Sets Record for First-Half Sales

Large First Quarter Overcomes Later Slackening—
Truck Sales Increase 25%

ATLANTA, June 19—According to automotive dealers and distributors in Atlanta the first half of 1928 has probably witnessed the largest volume of new passenger car business in the history of the Southeast for this period. Though sales during the second quarter have not been overly brisk they were considerably above normal in the first quarter, large enough to take the six months' period well above the normal level.

Used car business has been rather slow and most dealers still find themselves with rather sizeable stocks, in spite of the fact that many have been disposing of used car stocks at sacrifice prices.

Motor truck sales the first quarter of the year were estimated by leading distributors to have been about 30 to 35 per cent larger in the Southeast than last year for this period, and about 20 to 25 per cent larger the second period, with sales for the first half of the year considerably better than normal. All types of trucks have been in brisk demand this season, best business, however, being in lighter trucks.

Cadillac-La Salle Sales 17,437 in First 5 Months

DETROIT, June 21—Sales of Cadillac and La Salle cars in the first five months this year totaled 17,437, an increase of 39 per cent over the same period last year. Retail deliveries during this period increased 38 per cent. Sales of the La Salle car in the first year following its introduction March 5, 1927, totaled 16,581 as compared with 19,705 Cadillacs in the same period. In March and May this year La Salle sales exceeded Cadillac and in April sales were even. Exports in the first five months totaled 1337, an increase of 72 per cent. Of the exports, 691 were Cadillac cars and 646 La Salle.

20 Models in Elcar Line

ELKHART, IND., June 18—Elcar Motor Co. has classified all its models into five individual series. Twenty models are listed, priced from \$1,295 up, and comprising the entire range of body design. Seven sedans, four touring cars, three coupes, four roadsters and two coupes, all in unusual color combinations, make up the present Elcar line.

Lycoming engines are now used on all Elcar models. A special form-fitting cushion has been incorporated into the present series, and interior appointments of closed cars will be of mohair upholstery which is available in a variety of colors.

Men of the Industry and What They Are Doing

U.S. Delegates Go Abroad to Arrange Road Meeting

Preliminary steps for the 1930 meeting in Paris of the Permanent Association of International Road Congresses were taken the week of June 20 when the three official delegates of the U. S. Government sailed for France. The delegates are Thomas H. McDonald, chief of the bureau of public roads, Pyke Johnson, Washington representative of the National Automobile Chamber of Commerce, and H. H. Rice, vice-president of the same organization.

The delegates will spend approximately three months in Europe arranging preliminary details of the congress, which will be attended by representatives from approximately 50 countries, when it is called to order in 1930. The exact date of the meeting has not as yet been decided upon. Congress authorized an appropriation of \$15,000 to defray the expenses of its delegates. The primary purpose of the congress, as its name would indicate, is the construction of good highways throughout the world.

Henderson Leaves Martin-Parry

R. P. Henderson, vice-president in charge of sales for Martin-Parry Corp., York, Pa., and Indianapolis, Ind., is leaving that organization on July 1. His future plans are unannounced. Mr. Henderson was one of the founders of the Cole Motor Car Co. at Indianapolis and later built the Henderson car.

Markin Heads Checker Cab

Morris Markin, for many years vice-president of Checker Cab Mfg. Co., has been elected president, succeeding Duane R. Dills, the change being made after the repayment of advances from the Commercial Credit Co. and the retirement of the credit company from the management.

Upson Joins Chain Belt

Charles H. Upson, who for the past 23 years was district manager for the Dodge Mfg. Co., has joined the sales organization of the Chain Belt Co. With headquarters at Cincinnati he will represent the company's complete line of Rex chain and transmission machinery.

Reeves Addresses Convention

Alfred Reeves, general manager of the National Automobile Chamber of Commerce, spoke before the dealers convention of the Franklin Automobile Co. at Syracuse, June 12.

Buettner Vice-President

Walter J. Buettner, secretary and treasurer of the Bendix Corp., has been elected vice-president of the company in addition to his other capacities.

Wolcott Heads Party in Plane Sales Trip

Officials of Packard Electric Co. flew to Baltimore recently by airplane and held a meeting with representatives of the cable and ignition division. The party included N. A. Wolcott, president; B. N. McGregor, general sales manager; Charles Kloer, Eastern district sales manager, and John S. King, of the John S. King Co., advertising counsel.

Cudlip New Vice-President

Merlin A. Cudlip has been elected vice-president and secretary of Packard Motor Car Co. Mr. Cudlip started as a clerk in Packard's employment department 10 years ago. He rose to the position of assistant office manager and five years ago became secretary of the Packard company. Mr. Cudlip graduated from the University of Michigan in 1918.

Wait Joins Chance-Vought

William Wait, Jr., is leaving the Curtiss Airplane Corp. to join the Chance-Vought engineering organization. Mr. Wait is the designer of many successful planes, among them the Curtiss Robin commercial plane which is to be built in the newly organized Curtiss-Robertson factory at St. Louis. He also has designed Curtiss Pulitzer and Schneider Cup planes.

Goldie Leaves Nice Ball Bearing

R. J. Goldie, assistant general manager and director of sales of Nice Ball Bearing Co., Philadelphia, resigned June 1. Mr. Goldie was with the Ruggles Motor Truck Co. for five years, and was vice-president and general manager of the Columbia Axle Co. of Cleveland.

Burke Studebaker Secretary

John E. Burke has been elected secretary of the Studebaker Corp. of America and will also be assistant to A. R. Erskine, president of the company. Mr. Burke formerly was an accountant in Chicago.

Mrs. Anzell Goes Abroad

Mrs. A. S. Anzell, head of the Specialty Mfg. Co., Brooklyn, N. Y., will sail July 4 for Europe on a combined business and vacation trip. During her absence S. N. Duber will be in charge of the company's affairs.

Williams on Three-Months Trip

James Harvey Williams, head of J. H. Williams & Co., Buffalo, has sailed for a three-months trip to Europe.

A. W. Childs Takes Post in Automotive Division

The appointment of A. W. Childs to the position as assistant chief of the automotive division of the Department of Commerce is now effective. Mr. Childs succeeds I. H. Taylor, who has joined General Motors Export Corp. Prior to his appointment, Mr. Childs was traffic manager of the Packard Export Co. of New York. For one year he was a field representative in South America for the Dodge Brothers, Inc., being detailed by that organization to the Caribbean district.

Before his service with the two motor manufacturing concerns, he was for six years a vice-consul in the consular service of the State Department, having been detailed in Central and South America and Europe.

"The acquisition of Mr. Childs' service for the Automotive Division will mean much to the export business of the automobile manufacturers," declared H. O. Smith, chief of the automotive division. Mr. Childs will devote his energies primarily to placing before the manufacturer foreign trade possibilities and assisting the export departments of the manufacturers in extending their over-seas business.

Burgess Finds South Active

C. M. Burgess, president of the Burgess-Norton Mfg. Co., has returned from a trip through the South and reports business outlook very encouraging. He says everyone in the automotive field in St. Louis, Little Rock, Shreveport, LaFayette, New Orleans, Jackson and Memphis are happy over the outcome of the flood relief bill and are looking forward to excellent business.

Bodine Joins Raybestos

Alfred V. Bodine, for the last five years vice-president of the Dictaphone Corp., has left this company to become assistant to Sumner Simpson, president of the Raybestos Co. Mr. Bodine has a valuable background of manufacturing experience.

Hurley to Visit Branches Abroad

John D. Hurley, president of the Independent Pneumatic Tool Co., will sail for Europe on July 12. While on the Continent, Mr. Hurley will make a business tour of the company's foreign branches, returning to America the latter part of September.

W. E. Biggers Heads Company

W. E. Biggers, for six years assistant general manager of the Continental Screen Co., has resigned to become president of W. E. Biggers, Inc., Buffalo, a newly organized firm to distribute Graham-Paige cars.

Lift Truck Standards Adopted by Makers

General Conference of Manufacturers and Users to Approve Recommendations

WASHINGTON, June 16—Manufacturers of lift trucks and skids held a preliminary conference this week, under auspices of the division of simplified practice, Department of Commerce, for the purpose of formulating certain standards of dimension for hand and electric lift trucks.

The conference adopted two heights for lift truck platforms, in the low position, as follows: 7 in. high and 11 in. high. A maximum width of 27 in. for the lift truck platform was adopted as standard. It was voted that a minimum clearance between the under side of skid platforms and the top of lift truck platforms be three-quarters of an inch. After discussion in regard to the establishment of standard lengths of truck platforms, the conference voted to lay this matter on the table until after the question of skid sizes has been acted upon by other interests.

The conference requested the division of simplified practice to call a general conference of manufacturers and organized users on June 28, 1928, at which time the above approved recommendations of the manufacturers will be presented for formal approval. The following were appointed as a committee to represent the manufacturers at the general conference: Edward L. Leeds of Leeds, Tozzer & Co.; Walter C. Stuebing, president of Stuebing Cowan Co., and W. A. Meddick of the Lakewood Engineering Co.

Manning and Behr Combine

NEW YORK, June 18—Manning Abrasive Co., Inc., Troy, N. Y., and Herman Behr & Co., Inc., Brooklyn, have consolidated under the name Behr-Manning Corp. There will be no immediate change in the manufacturing or distributing policies of the combined companies. Both the Troy and Brooklyn plants will be continued, and orders be received at either plant.

Wolverine Tube Shows Gains

DETROIT, June 17—Wolverine Tube Co. stock has been listed on the Detroit Stock Exchange following an increase in its capital structure which now consists of \$293,500 first mortgage bonds, \$425,000 7 per cent preferred stock and 113,535 shares of common stock. Sales in 1927 totaled \$3,438,000 and earnings at the rate of \$2.04 a share on common stock. Earnings on common in the first quarter this year was at the rate of \$2.24 a share.

N.S.P.A. Doubles Show Space

DETROIT, June 18—The National Standard Parts Association has just closed a contract with the Cleveland

Auditorium by which the association has secured the main arena of the Cleveland Auditorium, as well as the exhibition hall, for the October show. This will give 60,000 sq. ft. of floor space gross for the 1928 show as compared to 30,000 sq. ft. available last year in which only the exhibition hall was used. Last year 146 exhibitors took part in the show while accommodations are being prepared for at least 250 booths this year.

Curtiss Stock Increase to Provide for Expansion

NEW YORK, June 17—Curtiss Aeroplane & Motor Co., Inc., stockholders will meet July 2 to ratify a plan for increasing the authorized capital stock from 300,000 to 600,000 shares of no par value. The new stock will be available for expansion and to give employees an opportunity to buy shares. The outstanding stock will not be increased at this time.

Present manufacturing facilities are barely sufficient for business now on hand, C. M. Keys, president, said. There is no margin for a large pending in commercial production both of engines and planes. If no plant expansion were to take place in the next year it would be impossible to schedule more than one-third of the commercial production deemed necessary by directors and officers, Mr. Keys said.

Aeronautical Chamber to Have Booth at Paris

PARIS, June 6 (by mail)—For the first time the Aeronautical Chamber of Commerce, Inc., will have a booth at the Paris Aeronautical Salon, to be held in the Grand Palais from June 29 to July 15, the location being a central one, opposite the Aero Club of France. Models, drawings, photographs and aviation magazines will be on exhibition, and the booth is intended to act as a center for Americans visiting Paris at that time.

De Soto Offices Moved

DETROIT, June 18—Headquarters of the De Soto Motor Corp., a division of the Chrysler Corp., which will produce the De Soto Six, have been moved from the Eaton Tower to the Highland Park plant of the Chrysler Corp. For four months the Eaton Tower offices have been the headquarters for C. W. Matheison, vice-president in charge of sales and the advertising, sales promotion and service departments and a clerical force. C. B. Gaunt, district manager for the Detroit territory, will also move his offices to the Chrysler plant.

Neff E. Parish

READING, PA., June 18—Neff E. Parish, founder of the Parish Mfg. Co., one of the largest makers of automobile frames, died in Berlin, Germany, last week. Mr. Parish sold the plant to the Spicer Mfg. Co. in 1919 and since has spent most of his time traveling for his health. He was 65 years old.

Financial Notes

Federal Motor Truck Co. in the first four months of 1928 shows net income of \$9,159 after all charges, equivalent to 20 cents a share on the 475,473 no-par shares of stock. The balance sheet as of April 30, 1928 shows current assets of \$6,250,788 and current liabilities of \$751,069, comparing with \$6,126,519 and \$654,633 on Dec. 31 last. Cash on April 30 totaled \$870,143 against \$1,374,369 at the end of 1927, and inventories were \$3,913,965 and \$3,592,416 respectively on these dates.

Wright Aeronautical Corp. as of March 31, 1928, after giving effect to the subsequent sale of 50,000 additional shares of stock, shows total assets of \$11,928,388 compared with \$6,869,760 on Dec. 31, 1927, and earned surplus of \$3,280,862 against \$2,932,772. Current assets were \$6,984,339 and current liabilities \$520,012 as compared with \$2,380,894 and \$598,529 respectively at the end of 1927.

Checker Cab Mfg. Co. is planning to re-finance its activities through the private issue of new stock and the retirement of its outstanding mortgages and notes, according to New York bankers. Earnings for the first quarter of 1928 are reported as \$205,000 or the equivalent of \$1.50 a share, while the earnings for the two months of April and May reached \$155,000 or \$1.14 a share.

Norwalk Tire & Rubber Co. reports for the quarter ended March 31, 1928, a net loss of \$41,018 after all charges, comparing with a net loss of \$7,634 in the preceding quarter and a net loss of \$46,953 in the first quarter last year. Net loss for the six months to March 31 was \$48,653 as against \$110,849 in the same period a year ago.

Western Auto Supply Co. has declared a regular quarterly dividend of 50 cents a share and a participating dividend of 66 cents a share on participating preference stock for the six months ended June 30. It is to be paid on presentation of stock for redemption on July 1.

Continental Motors Corp. reports net profit of \$807,497 for the six months ended April 30, equivalent to 46 cents a share earned on 1,760,845 shares of common stock outstanding. This compares with \$147,084 or eight cents a share in the corresponding period last year.

Pines Winterfront Co. reports net profit after all charges for the fiscal year ended April 30 as \$405,151. This is equal to \$4.05 a share on combined A and B stock outstanding, and compares with profit of \$404,211, or \$4.04 a share, for the preceding year.

Borg-Warner Corp. reports earnings in the first five months this year of \$1,913,982, equivalent after preferred stock dividend requirements to \$4.42 a share on 410,000 shares of common stock outstanding.

Dodge Brothers, Inc., has declared a quarterly dividend on preferred stock of \$1.75 payable June 27 to stockholders of record June 15.

British Plants Show Varying Year Results

Vulcan to Confine Operations to Trucks—Singer to Issue Bonus Shares

LONDON, June 4 (*by mail*)—The extremely diverse financial reports issued of late by British automobile manufacturers are well exemplified by announcements made by three companies during the past two days. In the first, the Vulcan Motor Co., one of the oldest concerns in the British industry, which originally produced passenger cars only but latterly has done better with trucks, has sustained a further loss on working during the past 12 months, bringing the debit balance to £570,000, or within £50,000 of its issued capital account. Passenger cars are to be discontinued in future and the plant concentrated upon trucks and buses.

Singer Motor Co., mainly owing to the increasing appeal of its 8 hp. model, announces that an issue of bonus preference shares to holders of existing ordinary shares will be proposed at the next annual meeting, the results of the current year (ending July 31) already justifying that step. This follows a bonus issue last year which resulted in doubling the capital account.

Thirdly, the makers of Karrier trucks, while reporting an increased turnover but very small profits, are preparing a scheme for capital reorganization to work off a debit balance of nearly £440,000.

Vauxhall Now Operating Well Up to Expectations

LONDON, June 6 (*by mail*)—The report concerning Vauxhall Motors Co. for the year ended Dec. 31, 1927, shows that the reorganization and extensions of the plant since General Motors Corp. acquired a controlling interest accounted for a capital expenditure of £350,000 and cessation of production for over eight months. In consequence, a debit balance of £121,017 has to be carried forward after taking credit for £275,200 received as premium of £4 per share on 68,000 £1 shares issued to General Motors, less £76,531 in respect of depreciation and debenture interest.

The cost of reorganization and consequent trading loss between January and December, 1927, was £320,943. The directors say, however, that the plant is now in full running order and that production and sales of the new model have been well up to expectations during the past six months. At the shareholders' meeting the chairman said among other things that, despite General Motors' interest in the company, every part of the cars now being produced was British except an American ignition distributor, certain parts of the clutch and some body panels and fittings.

Cold Defers Sales in United Kingdom

WASHINGTON, June 14—Cable advices from London to the Department of Commerce indicate that the automotive trade in the United Kingdom is holding a steady keel despite a slight decline in sales on account of unseasonably cold weather. Usually, it is stated, May is a peak sales month, but the season has been delayed this year. British light car manufacturers enjoyed a good month particularly in closed models, and popular types of American cars were in good demand, with 6-cylinder cars predominating. A tax of 4 pence per gallon placed on gasoline last month did not adversely affect the motor trade.

Hotchkiss Earns \$927,900, Ainsworth New Director

PARIS, June 5 (*by mail*)—A net profit of \$927,900, or, with reserves brought forward from last year, a total of approximately \$1,160,000 was declared by the Hotchkiss Co. at its annual general meeting just held in Paris. This covers the working of both the machine gun and the automobile sections of the company, for although these two are separate technical organizations, they constitute a financial unit.

The meeting elected H. M. Ainsworth a member of the board of directors. Joining the company 25 years ago in the capacity of junior draftsman, Mr. Ainsworth has occupied successive posts until for the last six years he has been chief engineer and general manager, without, however, having a directorship.

Dunlop Adds De Luxe Line

LONDON, June 5 (*by mail*)—Dunlop Rubber Co. will put on the market next month a range of de luxe tires. They have been evolved in view of the appreciably heavier stresses imposed upon tires in general owing to the increased acceleration, braking and average speed of modern passenger cars, and, supplementing the existing range, will be offered to motorists who reckon tire costs on a mileage basis and are relatively unconcerned as to the initial cost of equipment.

Selden Arranges Export Sale

NEW YORK, June 14—Selden Truck Corp. has made arrangements with the Grez International Corp. of New York City to handle its export business. The Grez company will conduct these operations under the name of the Selden Truck Corp., Export Department, and export transactions will be handled under the direct supervision and control of the Selden organization.

Fiat President Says Italian Sales Better

Industry Has Built Up Subsidiary Industries—Using American Methods

NEW YORK, June 14—The automotive industry in Italy can confidently look forward to a brilliant revival, says Giovanni Agnelli, president of the F.I.A.T. company, in an analysis of Italian trade conditions made for the International Power Securities Corp. In his review, Mr. Agnelli said: "To overcome the difficulties facing production in a country of recent industrial development such as Italy, the automobile industry had to build up a series of minor subsidiary industries, a need which made progress more difficult in Italy than elsewhere.

"The admiration with which the whole country, and more especially the leading trade concerns, have watched the remarkable expansion of the American automobile industry has induced us to study the means employed in the United States to secure the splendid results in the field of production and increased sales. These methods, modified to meet conditions of Italy, have already yielded results which will develop as time goes by.

"The revalorization of the lira, as was to be expected, created temporary trade depression, from which the industry is now recovering, and we may confidently look forward to a brilliant revival."

Paint Spray Equipment Finding Market in Chile

WASHINGTON, June 14—A steadily growing market for American paint spraying equipment of all sizes is reported in Chile by Assistant Commercial Attaché Robert G. Glover at Santiago, according to the Department of Commerce.

Paint sprayers have become popular during the last few months following the installation of American systems of spray painting at leading automobile paint and repair shops. Paint sprayers, following the first wave of popularity, were adopted not only by automobile shops but also by railroad and street car repair shops, furniture factories, dry docks, shipbuilding yards, tanneries and cabinet makers.

Coast S.A.E. Holds Smoker

SAN FRANCISCO, June 16—The northern California section of the Society of Automotive Engineers, Inc., held its annual stag dinner and smoker June 14, with the list limited to 150, which was filled. W. S. Penfield was chairman, with Fred L. Sargent assisting, and W. S. Crowell, secretary of the section, also assisting. For the evening all mention of engineering or other business was taboo.

Automotive Steels Hold Fair Demand

Third Quarter Buying Desul- tory—Prices Hold Firm Despite Competition

NEW YORK, June 21—Midsummer conditions are visible in the steel market, perhaps slightly more pronounced in some descriptions of steel than in others, but nevertheless the tapering-off in shipments as well as new orders is general. Full-finished automobile sheets continue to make a relatively good showing. Consumers are not very keen about making third-quarter contracts for hot-rolled strips and the opening of third-quarter books for hot-rolled steel bar orders at the new 1.90 cents, Pittsburgh, level is more or less of a formality.

Ordering of cold-finished steel bars is largely of a carload character. Attempts to mark up prices for billets and sheet-bars, so as to stiffen the price situation in the market for strip-steel and sheet bars have fallen flat and non-integrated rollers continue to pay unchanged prices for semi-finished material. Manufacturers of automotive alloy steels are operating at a more leisurely pace. All in all, the seasonal recession in demand is fairly general in all products and well distributed over the individual plants.

Amid these conditions prices present a rather steady front. In some lines there may be a concession made here and there to close an especially attractive contract but on the whole the price structure is fairly well maintained, more so than is usually the case when a very limited amount of business overhangs the market and mills are eager to get as large a share of it as possible.

Pig Iron—Automotive foundries continue to melt iron at an encouraging rate, but are taking their time about closing third-quarter contracts. The market may be characterized as a shade firmer. While some very low prices were established in recent round tonnage sales by Valley furnaces producers do not seem eager to sell additional tonnages at so attractive price levels.

Aluminum—European producers have decided upon a policy of extending the market for aluminum by making the metal available at reasonable prices to industries now using competitive materials, and, according to latest mail advices, this policy is to be pursued regardless of what the American producer's answer to the recent price reduction in the London market may be. Bonded stocks have been considerably reduced and imports have been running light so far this year. The market is entirely unchanged and of routine character, but consumers are watching developments closely.

Copper—Favored by a good statistical showing and good export demand, which only now is beginning to show signs of slowing down, copper producers are firm in their price views, naming 14% cents, delivered Middle West, and 14% cents, delivered, Connecticut. The market is more

than 2 cents per pound higher than it was at this time a year ago.

Tin—A somewhat firmer tone prevails, a moderate volume of consumer buying having lifted prices out of the rut. London is less perturbed about the outlook.

Lead—The market is steady, but quiet.

Zinc—Producers are showing a firm stand in the face of what has been called a buyer's strike, galvanizers having turned their back on the market recently to force lower prices.

Seek Standard Fuel for Diesel Engines

STATE COLLEGE, PA., June 16—Steps were taken at the oil and gas power meeting here this week to bring about some sort of standardization in Diesel engine fuels. The present situation, in which nearly every maker builds his engines for use with a fuel of different specifications from those required by every other maker's engines, was declared to have considerably delayed the development of the use of Diesel power in this country.

The meeting combined the first national meeting of the oil and gas power division of the American Society of Mechanical Engineers and the second annual Oil Power Conference of Pennsylvania State College. Topics discussed in addition to Diesel fuel oil specifications included the economic field for small and large Diesel engines, research progress in engine design and oil spray, and the manufacture of Diesel engines.

Trindl Opens Atlanta Warehouse

CHICAGO, June 18—The opening of a warehouse in Atlanta, Ga., is announced by the Trindl Corp., manufacturer of replacement parts. This is the fifth of a chain of warehouses and is in charge of Frank J. Merryman.

Export Men Review Conditions Abroad—

Accessory Competition Keen in Europe

NEW YORK, June 14—Automobile trade conditions in various parts of the world were reviewed at the regular meeting of the Overseas Automotive Club at Hotel Astor this week.

F. J. Werner of the Shaler Export Co., who has just returned from a four months' trip to Europe, spoke about conditions there, particularly in England, Belgium and France. He pointed out that competition in Europe on accessories was particularly keen, especially when American-made accessories are not adequately protected by patents. Under such circumstances local manufacturers who usually are protected by import duties were able to manufacture inferior articles and sell at a high price.

Mr. Werner also pointed out the tendency in the countries that have labor or socialistic governments to encourage a more general distribution of cars among the populace but referred to the charges recently made in the British House of Commons that the present

Balloon Tire Stocks Increase in April

High Production Rate Exceeds Shipments—High Pres- sure Stocks Lower

NEW YORK, June 16—Tire production during April showed a decline for all groups, according to the monthly survey of the Rubber Association of America, Inc., while shipments in all groups except balloon inner tubes showed an increase over the previous month. Production in balloon casings and tubes, however, kept ahead of shipments so that inventories at the end of the month were larger than they were at the beginning of the month, whereas the reverse was true of high pressure tires. Inventories of all tires were larger than at the end of the previous month.

Comparisons follow:

	Balloon Casings		
April, 1928	4,983,023	3,309,351	2,983,454
March, 1928	4,700,534	3,416,480	2,967,476
April, 1927	3,794,709	2,741,841	2,417,926
	Balloon Inner Tubes		
April, 1928	6,434,307	3,366,957	2,815,778
March, 1928	5,782,551	3,683,017	2,856,342
April, 1927	5,302,394	3,131,335	2,492,473
	High Pressure Cord Casings		
April, 1928	4,331,499	1,307,759	1,347,854
March, 1928	4,355,309	1,564,346	1,302,644
April, 1927	4,674,295	1,923,402	1,773,314
	High Pressure Inner Tubes		
April, 1928	6,044,843	1,628,576	1,459,826
March, 1928	6,071,983	1,740,238	1,442,162
April, 1927	8,049,012	2,398,601	2,276,912

Fokker to Build on Coast

SAN FRANCISCO, June 18—Early construction of an airplane factory on the Pacific coast is announced by Anthony H. G. Fokker.

conservative government, by its policy of high taxes, is attempting to make motor car ownership a class distinction, making it virtually impossible for the low salaried man to own a car.

Y. Osawa, dealer in General Motors cars in Kyoto, reviewed the history of the automotive market in Japan, enumerated the obstacles which are now in the way of bringing the market up to the present American standard. He is, however, optimistic as to the future of the automobile in Japan.

E. W. Fend, export manager of Willard Storage Battery Co., who has just returned from a trip through South Africa, told of his trip there. Two important features noted by Mr. Fend in his contacts with dealers in South Africa are a tendency on the part of American manufacturers to establish a large number of outlets without adequate attention to the quality of these outlets and a need for more careful packing.

Flint Track to Stage Feature Race Yearly

DETROIT, June 16—Several members of the contest board of the American Automobile Association who visited Flint this week, to inspect the site of the proposed 2½-mile concrete track which will be built there, were especially impressed with the railroad and highway facilities which the speedway will afford.

In the party were W. D. Edenburn, Michigan member; T. E. Meyers, veteran manager of the Indianapolis Speedway, who is being mentioned as the likely manager of the Flint Speedway, and A. C. Pillsbury, Los Angeles engineer, who will build the speedway-airport at Flint.

According to tentative plans one big racing event would be featured annually at Flint. It probably will be staged in the fall with Labor Day as the most likely date. The Flint race would correspond with the Indianapolis Memorial Day race as one of the great classics of the year, and because of the date would not conflict.

Chrysler Meeting July 17

DETROIT, June 16—At a special meeting of directors of the Chrysler Corporation it was voted to call a special meeting of stockholders at Detroit, July 17, to amend the Chrysler Corp. certificates of incorporation. The amendment will provide for the increase in the authorized common stock required for the completion of the Dodge Brothers purchase.

Builder of First Body Dies

PERU, IND., June 18—Louis J. Reed, accredited as the builder of the first automobile body, died at his home here last week, aged 81. Mr. Reed is said to have built the body of the first Haynes car, now in the Smithsonian Institution at Washington.

Coming Feature Issue of Chilton Class Journal Publications

Oct. 10—Marketing Annual for 1929—Motor World Wholesale.

Duray Sets Speed Mark on New Packard Track

DETROIT, June 16—A new world's speed record for a speedway was established here this week in a special test at the Packard Motor Car Co.'s new 2½-mile track when Leon Duray, in a front-drive Miller, negotiated one lap in 1 minute .739 seconds for an average of 148.174 m.p.h. The former record was set by the late Frank Lockhart at Atlantic City in 1927, when he averaged 147.174 m.p.h.

Packard's new track, located at their proving grounds near Utica, is of concrete. Turns have been banked 28 degrees and is so designed that a car can take them at full throttle. Today's event was arranged so the company could test the speed possibilities of the track. The test was officially observed by the contest board of the American Automobile Association.

Following the test with the racing cars, Col. Jesse G. Vincent, vice-president in charge of engineering of Packard, gave several demonstrations of speed in a Packard 8 roadster.

The speed events were privately staged and were viewed by practically all the principal executives and directors of the Packard company. Among the guests were Edsel Ford, president of the Ford Motor Co., and Charles Sorenson, also of the Ford company.

Wright in Bridgeport

BRIDGEPORT, CONN., June 18—The general sales office of the Wright Mfg. Co. is now located at 929 Connecticut Ave., this city.

A.A.A. Bus Division Meets in Cincinnati

WASHINGTON, June 18—Efficient handling of the more than 2,000,000,000 passengers using motor buses annually will be the keynote of the second annual convention of the motor bus division of the American Automobile Association, to be held at Cincinnati, June 27, 28 and 29, with representatives of the industry in attendance from all parts of the country.

Frank R. Fageol, president of the Twin Coach Co., Kent, Ohio, who will speak on "The Motor Bus—A Specialized Transportation Unit; Howard P. Fritch, president of the Boston & Maine Transportation Co., who will discuss How Motor Bus and Railroad Service Should be Coordinated, and E. Blythe Stason, professor of law, University of Michigan, whose subject will be Commission Control over the Certificate of Convenience and Necessity, will be among the principal speakers for the convention.

Numerous technical discussions such as bus terminals, equipment maintenance, systematic operation and merchandising the bus business will also be on the program during the three-day meeting.

Erskine Wins Polish Race

SOUTH BEND, June 16—Studebaker Corp. of America has received a cable from Warsaw, Poland, advising that an Erskine royal sedan last week defeated a field of 120 competitors in a race from Warsaw to Lodz, covering 1103 kilometers in 17 hours, 43 minutes. The race was arranged by the Automobile Club of Lodz, and included some of the most difficult highways in Europe. In winning first prize against a field including both European and American cars, the Erskine Six averaged 38.5 m.p.h. for the distance, which amounts to 684.96 miles.

Calendar of Coming Events

SHOWS

- American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
- American Road Builders Association, Inc., Cleveland Auditorium...Jan. 14-19
- American Society for Steel Treating, Commercial Museum, Philadelphia.....Oct. 8-13
- Automotive Equipment Association, Coliseum, ChicagoOct. 22-27
- BerlinNov. 8-18
- BrusselsDec. 8-19
- *ChicagoJan. 26-Feb. 2
- International Aeronautical Exposition, Grand Palais, Paris....June 29-July 15
- LeipzigAug. 26-Sept. 1
- London, passenger carsOct. 11-20
- National Standard Parts Association, Cleveland Auditorium...Oct. 29-Nov. 3
- *New York, Grand Central Palace...Jan. 5-12
- Paris, passenger carsOct. 4-14
- Paris, trucksNov. 15-25
- PragueSept. 1-9
- Salon, Automobile Salon, Inc., Hotel Drake, ChicagoJan. 26-Feb. 2
- Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles.....Feb. 9-16
- Salon, Automobile Salon, Inc., Hotel Commodore, New YorkDec. 2-8
- Salon, Automobile Salon, Inc., Palace Hotel, San Francisco...Feb. 23-Mar. 2

* Will have special shop equipment exhibit.

CONVENTIONS

- American Automobile Association, Bus Division Meeting, Cincinnati, June 27-28
- American Automobile Association, Annual Meeting, Cincinnati....June 28-29
- American Electric Railway Ass'n, Public Auditorium, Cleveland...Sept. 22-28
- American Gear Manufacturers Association, Statler Hotel, Buffalo, N. Y., Oct. 11-13
- American Road Builders Ass'n, Inc., Cleveland AuditoriumJan. 14-19
- American Society for Steel Treating, Commercial Museum, PhiladelphiaOct. 8-13
- American Society for Testing Materials, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J.June 25-29
- Automotive Equipment Association, Coliseum, ChicagoOct. 22-27
- National Association of Automobile Show and Association Managers, Before-Shows, Drake Hotel, ChicagoJuly 26-27
- National Safety Council, National Congress, New YorkOct. 1-5
- National Standard Parts Association, Hollenden Hotel, Cleveland, Oct. 29-Nov. 3

Society of Industrial Engineers, Rochester, N. Y.Oct. 17-19
World Motor Transport Congress, RomeSept. 25-29

A. S. M. E.

Cincinnati, Oct. 22-25—Machine Shop Practice.

Cleveland, Sept. 17-20—Fuels.

Detroit, June 28-29—Aeronautic Division.

S. A. E. National

Chicago, Aeronautic MeetingDec. 6-7

Detroit, Book-Cadillac Production MeetingNov. 22-23

Detroit, Book-Cadillac Annual MeetingJan. 15-18

Los Angeles, Aeronautic Meeting, Sept. 13-14

Newark, Robert Treat Hotel, Transportation MeetingOct. 16-18

New York, Annual Dinner, Hotel AstorJan. 10

Quebec, Chateau Frontenac....June 26-29

RACES

BelgiumAug. 12

FranceJuly 1

GermanyJuly 15

Great BritainSept. 22

ItalySept. 2

SpainJuly 29